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# New Records of the Stichaeid Fish *Ascoldia variegata knipowitschi* and the Zoarcid Fish *Puzanovia rubra* from Japan

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**Abstract** Eight specimens of the stichaeid, *Ascoldia variegata knipowitschi* and two specimens of the zoarcid, *Puzanovia rubra* were captured from the eastern waters of Hokkaido. These are recorded from Japan for the first time. The specimens are described and compared with the original descriptions.

During our study of the ichthyofauna of Hokkaido, we recently captured eight specimens of *Ascoldia variegata knipowitschi* Soldatov 1927, from off Kushiro, Hokkaido and two specimens of *Puzanovia rubra* Fedorov 1975, from off Cape Erimo and Kurile Islands.

*Ascoldia variegata knipowitschi* is very distinct in the subfamily Pholinae of the family Stichaeidae (Makushok, 1958) in having a single, vestigial pelvic spine, weak anal spines concealed in the fin membrane, and whole body and head covered with scales. Two subspecies, very closely related to each other, have been described in the species; *A. variegata variegata* Pavlenko known from only Peter the Great Bay (Pavlenko, 1910) and *A. variegata knipowitschi* from the Tarter Strait, Gulf of Terpenia, Aniwa Bay and Kurile Islands (Soldatov, 1927; Soldatov and Lindberg, 1930; Lindberg and Krasyukova, 1975). The present specimens captured from off Kushiro, therefore, are the first record of *A. variegata knipowitschi* from Japan.

*Puzanovia rubra* is distinguished among zoarcid fishes by red coloration, compressed body, and small gill opening not extending downwards beyond the lower base of pectoral fin. The present species was first described by Fedorov (1975) on the basis of specimens taken from the Bering Sea and the waters along Kurile Islands, and no other specimens have not yet been recorded. Thus, one of the present specimens obtained from off Cape Erimo is the first record of this species from Japan.

The specimens used here were preserved in 10% formalin and deposited in the Laboratory of Marine Zoology, Hokkaido University (HUMZ).

Counts and measurements were made in accordance with the method of Hubbs and Lagler (1958). For counts of vertical fin rays and vertebrae soft X-ray was used.

## Description

1. *Ascoldia variegata knipowitschi* Soldatov
(Japanese name: Doro-ginpo)

Fig. 1, A

Specimens examined: HUMZ 34051 (361 mm SL, female), HUMZ 34138 (379 mm SL, female), HUMZ 34141 (383 mm SL, female), HUMZ 34145 (404 mm SL, female), HUMZ 36161 (caudal part damaged, male), 98 meter deep, off Kushiro, eastern Hokkaido, July 17, 1974; HUMZ 41301 (404 mm SL, male), off Kushiro, September, 1973.

Counts and proportional measurements are shown in Table 1.

Body compressed and deep. Head moderately large. Snout blunt, its length a little longer than interorbital width. Eye round in shape, its diameter more than interorbital width. Interorbital space wide and convex. Mouth small, upper jaw not reaching to vertical below anterior margin of eye. Lips thickened, lower lip forming labial lobe. Small conical teeth in a single row on jaws, teeth on lower jaw slightly larger than those on upper one (Fig. 2, F, G). Vomer with some conical teeth (Fig. 2, E), but palatine

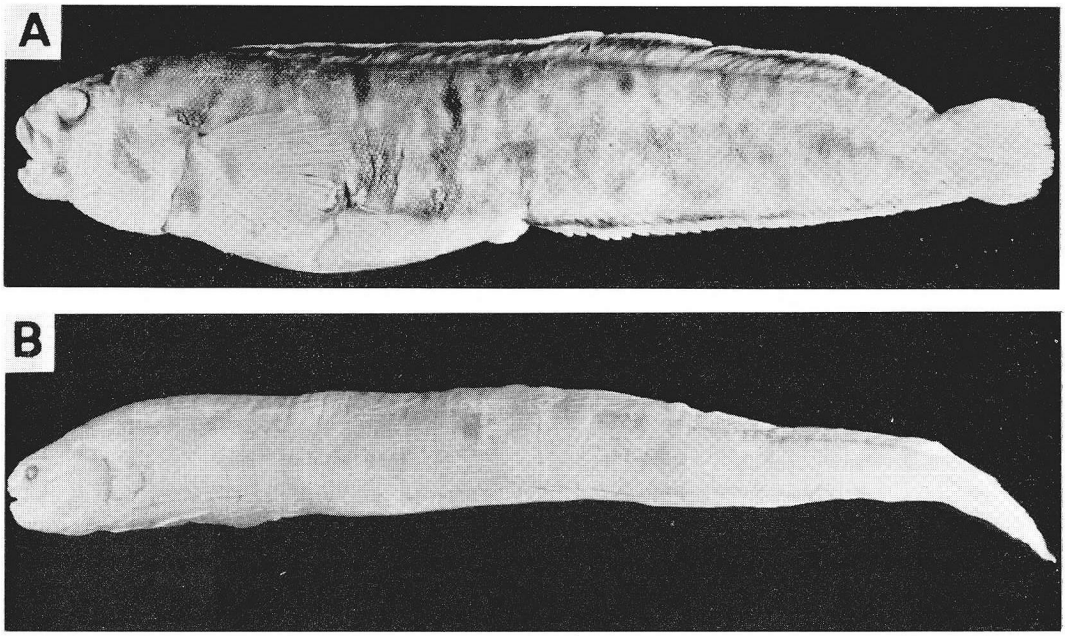


Fig. 1. *Ascoldia variegata knipowitschi* (A) from off Kushiro, HUMZ 41301 (404 mm SL, male) and *Puzanovia rubra* (B) from off Cape Erimo, HUMZ 57484 (282.7 mm TL, female).

toothless. Gill rakers 5～7+12～13, thin, short and pointed. Branchiostegals 4, the membrane broadly united, forming a fold acrossing isthmus and entirely free from it. Pseudobranchia present. Body densely covered with small cycloid scales, interorbital space and cheek also scaled. Lateral line absent. Cephalic sensory canal well developed; nasal pores 2, interorbital pores 5, postorbital pores 7, infraorbital pores 5, mandibular pores 4, preopercular pores 6, occipital pores 3 (Fig. 2, A, B).

Dorsal fin originating above gill opening, with flexible spines but stiff posteriorly. Anal fin originating below about 25th dorsal spine and with 2 weak spines concealed in fin membrane (Fig. 2, D). Pectoral fin large and rounded, its length longer than postorbital head length. Pelvic fin, with a vestigial single spine and 3 rays, very small and its length about equal to pupil (Fig. 2, C).

Color of fresh specimens: Body orange or yellowish with many irregular-shaped dark blotches along base of dorsal fin; dorsal surface of head darker; a dark band extending from eye to downwards; body before base of pectoral fin and preopercular region sometimes blackish. All fins except for pelvic orange; dorsal and anal fins with ocelli-like or irregular-shaped black blotches, and these blotches sometimes forming a horizontal band along submargins of those fins margined with light color.

**Remarks.** Soldatov (1927) separated *A. variegata knipowitschi* from *A. variegata variegata* by absence of anal spine (2 in the latter), fewer anal rays (34～36 instead of 38～39), pelvic fin with 1 spine and 3 rays (1 spine and 2 rays), shapes of caudal and pectoral fins, well developed cephalic sensory canal, body coloration not purplish, and isolated distributions.

However, it became clear that *A. variegata knipowitschi* has 2 anal spines (Matsubara, 1955; Lindberg and Krasyukova, 1975), and shapes of caudal and pectoral fins, and the degree of the development of cephalic sensory canal also are similar between the two subspecies (Lindberg and Krasyukova, 1975: 102, figs. 78, 79). Further, the fishes of Pholinae appear to show much variation in body

Table 1. Comparison of the present specimens with *Ascoldia variegata variegata* and *A. variegata knipowitschi*. Proportional measurements (in SL and in HL) of the latter subspecies were calculated from the actual lengths shown by Soldatov (1927). Asterisks after Lindberg and Krasyukova (1975).

| | *A. variegata variegata* Pavlenko (1910) | *A. variegata knipowitschi* Soldatov (1927) | Present specimens |
|---|---|---|---|
| Total length (mm) | — | 57~97 | 388~433 |
| Standard length (mm) | 115~240 | 52~83(*440) | 346~404 |
| In SL: | | | |
| Head length | 5 | 4.0~4.6 | 4.9~5.7 |
| Depth of body | 4 | 4.7~6.3 | 4.3~4.9 |
| In HL: | | | |
| Pectoral fin | 1.5 | 1.3~1.6 | 1.4~1.7 |
| Eye diameter | 4.6 (young) 6.9 (adult) | 3.6~4.5 | 4.9~5.8 |
| Depth of caudal peduncle | 2 | 2.7~3.3 | 2.3~2.7 |
| Snout length | 4 | 4.3 | 3.5~4.2 |
| Counts: | | | |
| Dorsal | LX~LXVIII | LVII~LIX(*LIX~LXI) | LIX-LXV |
| Anal | II, 38~39 | 34~36(*II, 34~36) | II, 35~36 |
| Pectoral | 20~21 | 20~22 | 20~22 |
| Pelvic | I, 2 | I, 3(I, 2?) | I, 3 |
| Vertebrae | 64~65 | — | 64~66 |

coloration, and they generally have wide range in distribution.

Thus, these two subspecies appear to be separable only by the difference of anal ray counts. The present specimens nearly agree with both subspecies in proportional measurements (Table 1), and resemble *A. variegata variegata* in general appearance in comparison with the figures of Lindberg and Krasyukova (1975). But we identified them as *A. variegata knipowitschi* because of the agreement of anal ray counts.

The present subspecies was cited by Okada and Matsubara (1938: 399) and by Matsubara (1955: 760) on the basis of the record from Shanter Islands, western part of the Okhotsk Sea, and they gave Japanese name "Doroginpo" to it. But it has not been recorded from Japan, so far as we are aware.

2. *Puzanovia rubra* Fedorov
(New Japanese name: Aka-genge)

Fig. 1, B

Specimens examined: HUMZ 57484 (282.7 mm TL, female), 500~600 meter deep, off Cape Erimo, eastern Hokkaido, June, 1975; HUMZ 57485 (231.0 mm TL, sex unknown), 375 meter deep, off Kurile Islands (48° N, 153° E), August 10, 1975.

Counts and proportional measurements in per cent of TL and HL used for comparison are shown in Table 2.

In TL: preanal 3.7, predorsal 8.6~10.4, head 8.5~9.2, pectoral fin 20.8~28.5.

In HL: head width 2.1~3.0, snout 5.0~5.2, upper jaw 2.0~2.3, eye 5.7~7.2, interorbital width 4.6~9.7, depth of body at origin of anal fin 1.3~2.0, gill opening 2.6~3.1.

Body very elongate and compressed, body deepest near pectoral tip. Head small and compressed (Fig. 3, B). Snout bluntly rounded and short, its length about equal to or a little longer than eye. A nostril tube-like, projecting forward. Eye small and round, its diameter about as long as or a little shorter than snout. Mouth small in size, jaws about even. Upper jaw reaching to vertical below posterior margin of eye or slightly

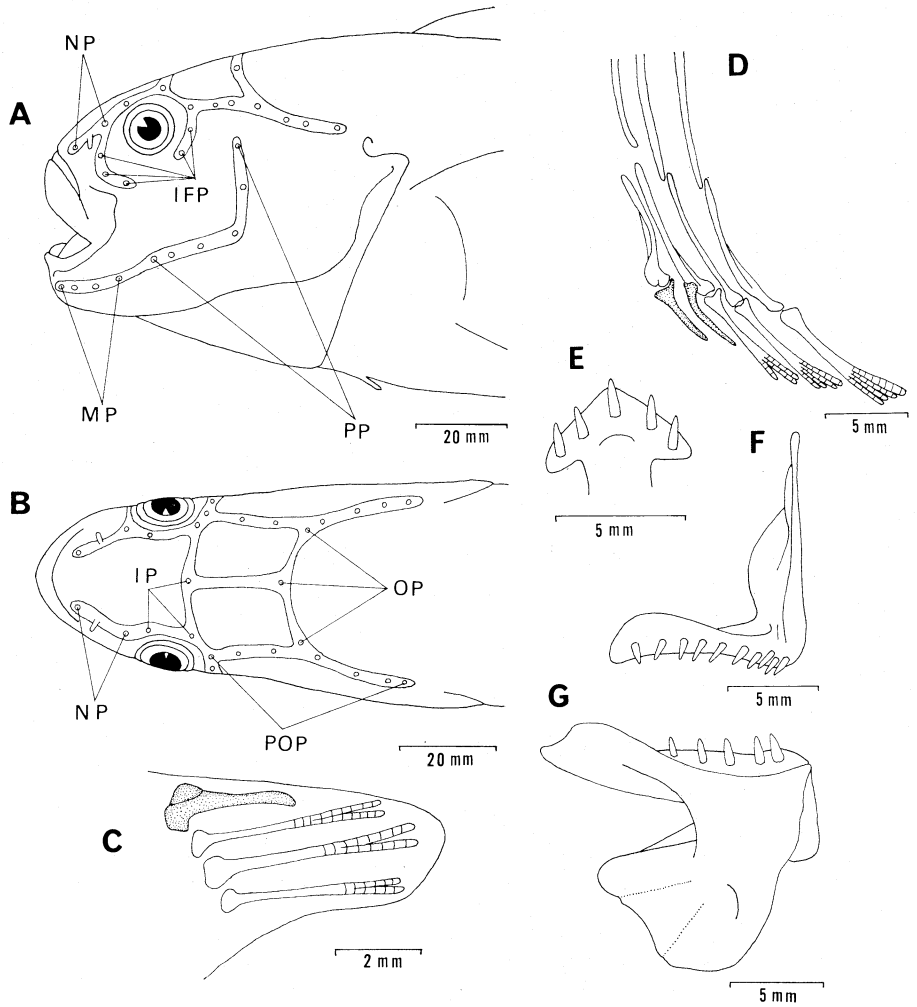


Fig. 2. Illustrations showing cephalic sensory canal (A, B), pelvic fin on right side (C), anterior anal fin (D), vomerine teeth (E), upper jaw teeth (F) and lower jaw teeth (G) in *Ascoldia variegata knipowitschi*. A～B, HUMZ 41301 (404 mm SL, male); C～G, HUMZ 36161 (caudal part damaged, male). NP, nasal pores; IFP, infraorbital pores; MP, mandibular pores; IP, interorbital pores; OP, occipital pores; POP, postorbital pores; PP, preopercular pores.

beyond of it. Lips thick, especially in lower jaw. Teeth on jaws conical; upper jaw teeth arranged in 3 rows anteriorly and 2 rows laterally, anterior outer one larger; lower jaw teeth in 2 rows anteriorly and in a single row laterally (Fig. 3, D). Vomer toothless. Palatine teeth 6～8 in number arranged in a single row (Fig. 3, D). Palatine membrane well developed. Gill opening small, its lower end reaching to lower base of pectoral fin. Gill rakers conical or divided into 2～4 lobes in their tips. A small pore behind last gill arch. Pseudobranchia with 6 or 7 filaments. Scales poorly developed, posterior half of body sparsely covered with small cycloid scales, but body before anus entirely scaleless. Lateral line indistinct. Cephalic sensory canal well developed (Fig. 3, A, B); nasal pores 2, infraorbital pores 6, preopercular pores 4, mandibular pores 4, postorbital pores 4, interorbital pores 3, occipital pores 3.

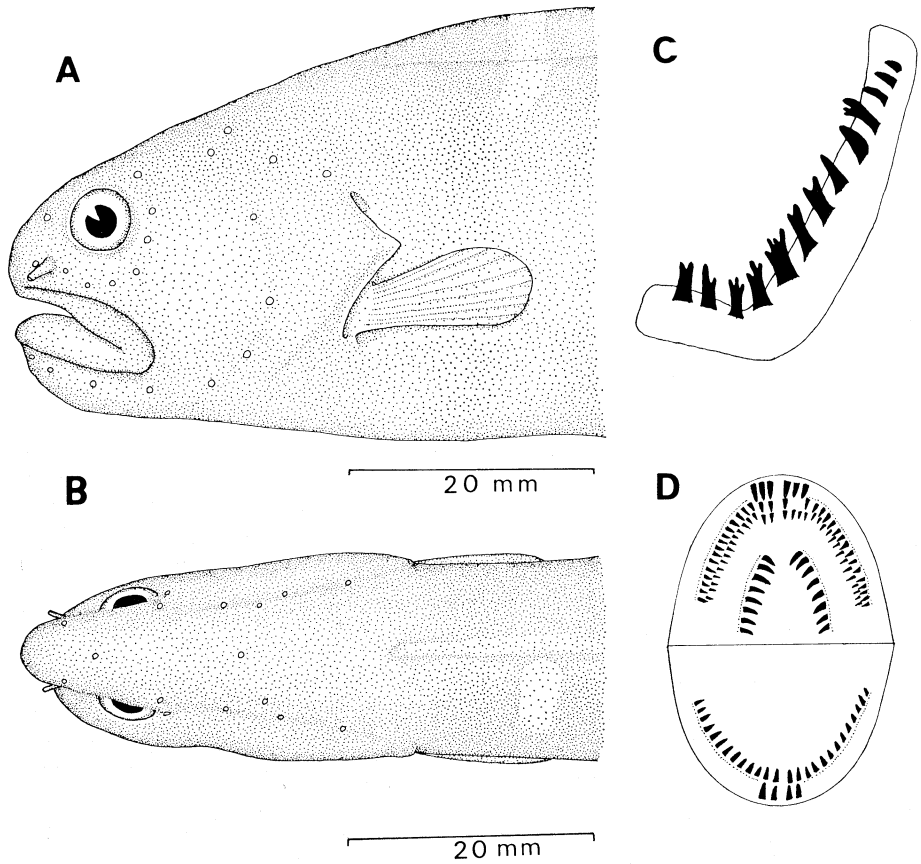


Fig. 3. Lateral (A) and dorsal (B) views of head, and diagrammatic illustrations of shapes of gill rakers (C) and dentition (D) in *Puzanovia rubra*. A~D, HUMZ 57484 (282.7 mm TL, female).

Vertical fins continuous and thickened. Dorsal fin originating above base of pectoral fin. Anal originating below 23th dorsal ray. Pectoral fin small and with narrow base, its length about equal to upper jaw. Pelvic fin absent.

Color of fresh specimens: Body reddish with 22 paler narrow oblong bands on dorsal half of body extending onto dorsal fin. Similar 2 or 3 bands on anal fin (HUMZ 57484). No bands on body or fins (HUMZ 57485). Belly reddish or dark blue. Oral and gill cavities light. Peritoneum blackish. All fins reddish.

**Remarks.** The present specimens characterized by a small gill opening, no pelvic fin and no or poorly developed scales, are closely related to a several zoarcid genera, *Nalbantichthys*, *Melanostigma*, *Cidiphorus*, *Lycocara* and *Puzanovia*.

The former three genera are clearly different from these specimens in a very small gill opening not extending to the lower base of pectoral fin (rather larger, extending to it in the latter) (McAllister and Rees, 1964; Schultz, 1967).

In the monotypic genus *Lycocara*, the size of gill opening was unknown, but it clearly differs from the present specimens with fewer dorsal and anal rays (50 and 45 as against 135~138 and 114~117 in the latter) (Jordan and Evermann, 1898).

Diagnostic characters of the monotypic genus *Puzanovia* Fedorov, 1975 agree with the present specimens as mentioned above.

Table 2. *Puzanovia rubra*: comparison of the present specimens with those of Fedorov (1975). M±SE (Mean±Standard error)

| | Fedorov (1975) | | Present specimens | |
|---|---|---|---|---|
| | Holotype | Paratypes M±SE | HUMZ 57484 | HUMZ 57485 |
| Total length (mm) | 230 | 245～268 | 282.7 | 231.0 |
| | | % of TL | | |
| Head length | 10.18 | 11.23±0.092 | 10.89 | 11.73 |
| Deepest depth of body | 10.00 | 8.96±0.124 | 10.39 | 6.83 |
| Preanal length | 25.12 | 26.15±0.125 | 27.02 | 27.19 |
| Predorsal length | 11.74 | 11.18±0.125 | 9.65 | 11.69 |
| | | % of HL | | |
| Snout length | 17.5 | 21.28±0.248 | 20.12 | 19.18 |
| Eye diameter | 20.1 | 16.89±0.247 | 13.96 | 17.71 |
| Upper jaw length | 46.1 | 47.00±0.588 | 50.00 | 43.54 |
| Pectoral fin length | 44.9 | 41.55±0.621 | 44.15 | 29.88 |
| Gill slit length | 40.6 | 34.32±0.520 | 38.63 | 32.47 |
| Interorbital width | 18.1 | 18.61±0.412 | 21.75 | 10.33 |
| | | Counts | | |
| Dorsal rays | | 137～147 | 135 | 138 |
| Anal rays | | 115～128 | 114 | 117 |
| Pectoral rays | | 10～12 | 9 | 9 |
| Vertebrae | | 134～147 | 137 | 140 |
| Gill rakers | | (13) 14～15 (17) | 3+10=13 | 3+12=15 |
| Branchiostegals | | 6 | 6 | 6 |

The present specimens are mostly within the range of *P. rubra* in the proportional measurements and meristic counts (Table 2), and resemble that species in the unique coloration. But these specimens somewhat differ from it in the absence of teeth on vomer and in the presence of light transverse bands on body, dorsal and anal fins. According to Fedorov (1975), his specimens have one or two teeth on the vomer and toothed or toothless palatine. Since the teeth on these bones show a tendency to be reduced or disappear in this species, the presence or absence of vomerine teeth can not be considered as an important character in this species. Further, the color bands are more or less variable in the zoarcid fishes.

Thus, the present specimens were identified as *P. rubra*.

This species has been recorded from the Bering Sea, the waters along Kurile Islands, and the northwestern Okhotsk Sea (Fedorov, 1975). One specimen from off Cape Erimo is the first record of this species from Japan.

**Acknowledgments**

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## 日本初記録のドロギンポとアカゲンゲ

尼岡邦夫・豊島　貢・稲田伊史

北海道およびその近海の魚類相を研究中，タウエガジ科，ドロギンポ属 (*Ascoldia*) のドロギンポ *A. variegata kninowitschi* とゲンゲ科，アカゲンゲ属 (*Puzanovia*) のアカゲンゲ (新和名) *P. rubra* が北海道の東部太平洋岸および千島列島より得られた．

ドロギンポ属には本亜種の他にニシドロギンポ *A. variegata variegata* が報告され，いずれも 1 本の退化的腹鰭棘と鰭膜につつまれた弱い 2 本の臀鰭棘を持つことによって特徴づけられているが，これらを分類する形質は明確でない．そこで本標本と 2 亜種を比較検討した結果，これら 2 亜種は臀鰭軟条数によってのみ分けられ，本標本はドロギンポに同定された．本亜種は以前，オホーツク海および樺太と千島列島沖から報告されていたが日本近海からは初記録である．

一方，アカゲンゲは Fedorov (1975) によって，ベーリングおよびオホーツク海などからの標本により新属新種として記載され，体が赤いこと，鰓孔が小さいこと，腹鰭がないことおよび鼻管が伸長することなどで，ゲンゲ科の中では非常に特徴的である．本標本は上記の特徴，体節的形質および測定比においてアカゲンゲによく一致した．本種は日本からの初記録である．

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